Listing of Claims

1. (Previously presented) A method of producing a protein with an increased antimicrobial activity or polypeptide stability, comprising:

replacing an arginine residue in a polypeptide of interest with a tryptophan residue or a phenylalanine residue to produce a tryptophan-substituted or phenylalanine-substituted polypeptide; and

comparing the antimicrobial activity or polypeptide stability of the polypeptide of interest with the tryptophan-substituted or phenylalanine-substituted polypeptide, wherein the tryptophan-substituted or phenylalanine-substituted polypeptide has increased antimicrobial activity or polypeptide stability compared to the polypeptide of interest, and wherein the tryptophan-substituted or phenylalanine-substituted polypeptide has similar antimicrobial activity or increased polypeptide stability compared to the polypeptide of interest wherein the arginine residue is ADP-ribosylated,

thereby producing the protein with increased antimicrobial activity or polypeptide stability.

2. (Previously presented) The method of claim 1, wherein the tryptophan-substituted or phenylalanine-substituted polypeptide has an increased antimicrobial activity.

3. (Original) The method of claim 2, wherein the antimicrobial activity comprises chemotaxis of T cells, neutrophil recruitment, or cytokine release.

4. (Original) The method of claim 3, wherein the cytokine release comprises interleukin-8 release.

5. (Original) The method of claim 2, wherein the protein is a defensin.

6. (Original) The method of claim 5, wherein the defensin is an alpha defensin.

7. (Previously presented) The method of claim 2, wherein the arginine residue is substituted with a tryptophan residue.

8. (Previously presented) The method of claim 2, wherein the arginine residue is substituted with a phenylalanine residue.

9. (Previously presented) The method of claim 2, wherein the activity is increased as compared to the polypeptide of interest.

10. (Previously presented) The method of claim 2, wherein the stability is increased as compared to the polypeptide of interest.

11. (Previously presented) The method of claim 2, wherein the increased activity or stability is a 100% increase, as compared to a control polypeptide.

12. (Previously presented) The method of claim 2, wherein the increased activity or stability is a 50% increase, as compared to a control polypeptide.

13-18. (Canceled)

19. (Currently amended) A composition comprising, a human defensin polypeptide of interest comprising an amino acid sequence wherein at least one arginine residue in the human defensin polypeptide of interest is substituted with a tryptophan or a phenylalanine residue to produce a tryptophan-substituted or phenylalanine-substituted human defensin polypeptide, wherein the tryptophan-substituted or phenylalanine-substituted human defensin polypeptide has similar antimicrobial activity or increased polypeptide stability, compared to the human defensin polypeptide of interest wherein the at least one arginine residue is ADP-ribosylated.

20. (Currently amended) The composition of claim 19, wherein the human defensin polypeptide has an antimicrobial activity.

21. (Original) The composition of claim 20, wherein the arginine residue is substituted with a tryptophan residue.

22. (Original) The composition of claim 20, wherein the arginine residue is substituted with a phenylalanine residue.

23. (Original) The composition of claim 20, wherein the antimicrobial activity comprises chemotaxis of T cells, neutrophil recruitment, or cytokine release.

24. (Canceled) ~~The composition of claim 20, wherein the protein is a defensin.~~

25. (Currently amended) The composition of claim ~~24~~19, wherein the human defensin is ~~an~~ a human alpha defensin.

26. (Currently amended) A pharmaceutical composition comprising a therapeutically effective amount of a human defensin comprising at least one arginine residue that is substituted by a tryptophan or a phenylalanine residue.

27. (Currently amended) The pharmaceutical composition of claim 26, wherein the human defensin has antimicrobial activity.

28. (Original) The pharmaceutical composition of claim 27, wherein the antimicrobial activity comprises chemotaxis of T cells, neutrophil recruitment or cytokine release.

29. (Previously presented) A method of increasing antimicrobial activity or polypeptide stability of a defensin polypeptide of interest, comprising:

substituting an arginine residue in the defensin polypeptide of interest with a tryptophan or a phenylalanine to produce a tryptophan-substituted or phenylalanine-substituted defensin polypeptide;

comparing the antimicrobial activity or polypeptide stability of the defensin polypeptide of interest with the tryptophan-substituted or phenylalanine-substituted defensin polypeptide, wherein the tryptophan-substituted or phenylalanine-substituted defensin polypeptide has increased antimicrobial activity or polypeptide stability compared to the

defensin polypeptide of interest, and wherein the tryptophan-substituted or phenylalanine-substituted defensin polypeptide has similar antimicrobial activity or increased polypeptide stability compared to the defensin polypeptide of interest wherein the arginine residue is ADP-ribosylated,
thereby increasing the antimicrobial activity or the polypeptide stability of the defensin polypeptide.

30. (Original) The method of claim 29, wherein the defensin polypeptide is an alpha defensin.

31. (Canceled)

32. (Previously presented) The method of claim 29, wherein the antimicrobial activity comprises T cell chemotaxis, neutrophil recruitment, or cytokine release.

33. (Previously presented) A method of increasing an antimicrobial immune response in a subject infected with or at risk of being infected with a microbe, comprising administering to the subject a therapeutically effective amount of a defensin polypeptide comprising an amino acid substitution, wherein the amino acid substitution is a replacement of an arginine in a defensin polypeptide of interest with a tryptophan or a phenylalanine to produce a tryptophan-substituted or phenylalanine-substituted defensin polypeptide, wherein the tryptophan-substituted or phenylalanine-substituted defensin polypeptide has similar antimicrobial activity or increased polypeptide stability, compared to the defensin polypeptide of interest wherein the at least one arginine residue is ADP-ribosylated,
thereby increasing the antimicrobial immune response in the subject infected with or at risk of being infected with a microbe.

34. (Original) The method of claim 33, wherein the immune response comprises T cell chemotaxis, neutrophil recruitment, or cytokine release.

35. (Original) The method of claim 33, wherein the subject has an immune disorder.

36. (New) The composition of claim 25, wherein the human alpha defensin comprises an amino acid sequence having at least 95% sequence identity to the amino acid sequence set forth as SEQ ID NO: 3.

37. (New) The composition of claim 36, wherein the human alpha defensin comprises an amino acid sequence having at least 98% sequence identity to the amino acid sequence as set forth as SEQ ID NO: 3.

38. (New) The composition of claim 37, wherein the human alpha defensin comprises an amino acid sequence as set forth as SEQ ID NO: 3.

39. (New) The composition of claim 25, wherein the human alpha defensin comprises an amino acid sequence as set forth as SEQ ID NO: 2.

40. (New) The composition of claim 39, wherein the human alpha defensin consists of an amino acid sequence as set forth as SEQ ID NO: 2.

41. (New) The composition of claim 26, wherein the human defensin is a human alpha defensin.

42. (New) The composition of claim 41, wherein the human alpha defensin comprises an amino acid sequence having at least 95% sequence identity to the amino acid sequence set forth as SEQ ID NO: 3.

43. (New) The composition of claim 42, wherein the human alpha defensin comprises an amino acid sequence having at least 98% sequence identity to the amino acid sequence as set forth as SEQ ID NO: 3.

44. (New) The composition of claim 43, wherein the human alpha defensin comprises an amino acid sequence as set forth as SEQ ID NO: 3.

45. (New) The composition of claim 41, wherein the human alpha defensin comprises an amino acid sequence as set forth as SEQ ID NO: 2.

46. (New) The composition of claim 45, wherein the human alpha defensin consists of an amino acid sequence as set forth as SEQ ID NO: 2.

47. (New) The composition of claim 19, wherein the human defensin comprises six conserved cysteines residues that form three disulfide bonds.

48. (New) The composition of claim 26, wherein the human defensin comprises six conserved cysteines residues that form three disulfide bonds.